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(54) An extruded net bag for packing bulk products, and a method for its manufacture.

(57) The bag comprises a portion of a flattened tubular element (1) provided with smooth non apertured zones (4, 5) and alternating net zones (2, 3) and having smooth zones adjacent at least that edge (17) of the tube which forms the mouth of the bag, which has one or two transverse welds (28, 30, 33) in the zone adjacent the bag mouth, so as to define a zone bearing punched zones (22, 32) in both sides of the bag and forming an opening serving as a handle. The sides of the bag are formed with welds (18, 19) which extend from the bottom edge to the smooth top edge without reaching the mouth.

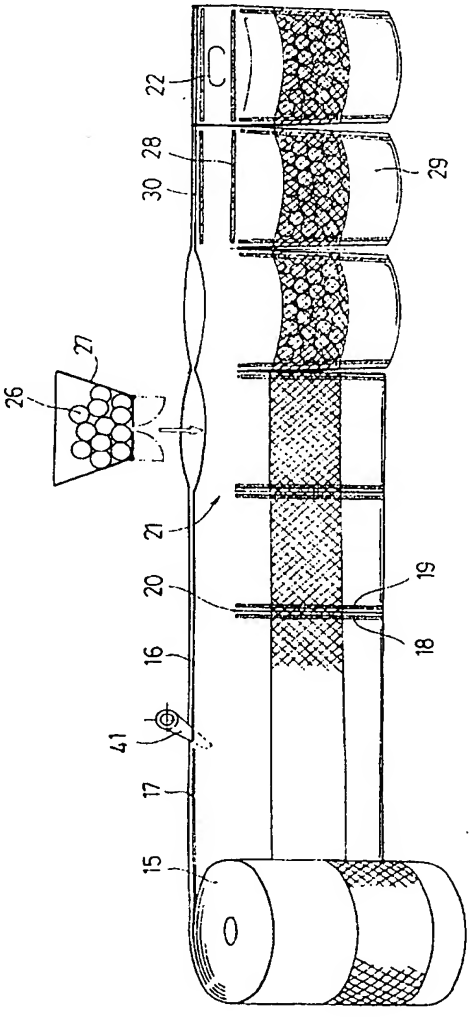

FIG.5

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OCT Search Report

The present invention relates to an extruded net bag for packing bulk products and a method for its manufacture, the method having substantial novel features and inventive merit.

The novel bag is of use particularly for automatic packing of bulk products, especially horticultural products, in bags having a guaranteed weight and a tamper-proof closure.

The net material can be in the form of threads or in laminar form, the result in the latter case being a flat structure called "laminette".

At present, the kind of bags to which the present invention refers are made from a tube extruded totally in the form of net or with longitudinal net-like strips and continuous strips in between, the continuous strips being used for information and instructions in accordance with the "General Standard for Labelling, Display and Advertising of Packed Food Products", optionally together with advertising material. The strips also of course serve as a mechanical reinforcement of the bags.

At present, the bags are individually manufactured in a process comprising transverse cuts of the previously-manufactured net tube, welding along the cut edges respective continuous strips of material forming the upper part of the bags, punching said strips to form cavities for handles, and transverse welding perpendicular to the axis of the tubular element, thus defining the separation between each pair of successive bags.

A partly-cut line is formed between each pair of successive welds bounding the bags, so that individual bags can be separated subsequently. After this process, the tubular element subjected to the previously-mentioned process is rolled up and the roll is prepared for delivery to the packing machines.

In the system known at present and briefly described hereinbefore, there are substantial disadvantages from the economic point of view, owing to the relative complexity of manufacture of the bag as regards welding the detachable zones for receiving the handles, handling, storage and transport of the rolls of bags, and irregularities due to differences in thickness in the roll of bags. Other known kinds of bags are also relatively complicated to manufacture, e.g. bags with ribbons or strips disposed at the edges and in the form of a sheath over the closed mouth for the purpose of closing it and providing a handle, and other kinds of bags in which the components forming the handles are separately joined by sewing, riveting or welding.

The aim of the bag according to the present patent of invention is to obviate the previously-mentioned disadvantages by providing a greatly simplified and very efficient bag construction and enabling the rolls to be constructed with very uniform cross-sections, thus facilitating all the handling operations and reducing the space occupied by the rolls of bags.

Basically, manufacture of the bags according to the present invention is characterised in that a flattened tubular structure is formed comprising a number of individual bags separated by welding lines and intermediate partially cut lines, the mouths of the individual bags being situated at one side and the bags having a mixed structure made up of net-like zones and smooth non apertured zones, characterised in that the zones adjacent the mouths are punched to form through apertures which when aligned form a handle for holding and carrying the bag. To this end, a smooth zone of sufficient width has to be disposed between the bottom edge of the apertures forming the handle and the beginning of the net zone, where a transverse closing weld is made in the automatic filling machine to which the roll of bags is supplied. Preferably the smooth zone between the mouth and the edge of the net strip is sufficiently wide to adequately combine strength with lightness of the bag and so that the width of the zone is sufficient for punching the handle apertures, for forming the weld for closing each bag, and for guaranteeing the strength of the handle zone.

The bag according to the present invention has a construction which can be manufactured in novel manner and very economically in the actual packing machine, which simply needs to comprise means for longitudinally cutting the tube and double welding to form two parallel welds which start from the bottom edge of the flattened tube and do not reach the opposite edge made by the longitudinal cut. A partial cut is made between the aforementioned welds. The welds and the cuts preferably extend over 75% of the corresponding total dimension of the bag. The method is characterised by the following steps:

- Extrusion of the initial tubular element, preferably with a mixed structure comprising net-like zones and smooth non apertured zones, being wider the smooth zones corresponding to the edge for subsequent cutting for forming the mouth of the bag.
- The tubular element manufactured with a mixed structure of smooth zones and net-like zones is rolled and the roll is supplied to the feed means of the packing machine. Optionally, this step can be eliminated if the machine for manufacturing the tubular bag element is combined and co-operates with the packing machine.
- The tube is longitudinally cut along the central line of the wide continuous strip of the tubular element.
- The adjacent transverse double welds for laterally separating the bags are formed.
- A partial cut is made between each pair of adjacent transverse welds corresponding to the sides of the bag.
- The individual bags are filled.

- One or two transverse welds are made in each bag at the place near the mouth, and
- Openings are simultaneously punched in the two continuous strips adjacent the side opening, in order to form a handle for the bag and an optional arcuate or polygonal cut of the top edge.

As can be seen, bags having the aforementioned features and constructed in the set of aforementioned operations result in a great simplification of the manufacture of the bags without adverse effect on the functional characteristics thereof.

The bag according to the invention can be varied in numerous ways without affecting its essential nature as defined. For example, the strength of the handle zone can be improved as aforementioned by introducing a second transverse weld line parallel to and simultaneously with the closure weld and situated between the openings for the bag handle and the edges of the mouth thereof, or the weld can be replaced by limited reinforcement zones in linear form or by small welded areas or spot welding or the like. The same applies to the structure and arrangement of the handle openings, which can be given widely varied configurations.

Variations can also be made in the number of smooth zones or strips and net-like zones or strips, but preferably there are at least two net zones which are directly opposite one another, i.e. symmetrically arranged with respect to the longitudinal plane of the bag.

There now follows a description of a preferred embodiment of the bags according to the invention and of the method of making them.

Figs. 1, 2 and 3 are respective views in perspective of parts of a tubular element which is mixed, i.e. comprises net zones and smooth non apertured zones according to the present patent of invention;

Fig. 4 is a perspective view of a roll of a tubular element prepared for welding, filling and completing the bags;

Fig. 5 is a perspective view showing the steps of transversely welding the roll of bags, and partial cutting, filling and completion of the bags;

Figs. 6, 7, 8 and 9 are respective views in perspective showing the construction of bags with various arrangements of net zones and smooth non apertured zones, and

Figs. 10 and 11 are respective views of a completed bag.

In the drawings, Fig. 1 shows a tubular element 1 comprising symmetrical net-like zones 2 and 3 and upper and lower smooth non apertured zones 4 and 5, in a version in which the continuous top strip 4 is much wider than the bottom strip, and the netting strips 3 are relatively narrow.

Fig. 2 shows a version in which the tubular element has a continuous upper strip 6 wider than the lower strip 7, and respective lateral strips 8 and 9 which are wider.

Fig. 3 shows a version in which the tubular element has a continuous upper strip 10 wider than the lower strip 11, with lateral pairs of strips which are three in number in the drawing, indicating that their number can be variable. The drawing shows respective pairs of strips 12, 38, 13, 39, 14 and 40, the strips forming each pair being opposite one another, and separated by narrow smooth non apertured zones.

After the tubular element 1 has been manufactured, it is optionally flattened and rolled into a roll 15 (Fig. 4) which is supplied to the packing machine. In one variant of the process, the tubular element 1 can be directly supplied to the packing machine without the need for intermediate rolling, if the machine for manufacturing the tubular element 1 is associated and co-operates with the packing machine.

The next step in manufacture consists in cutting along one side edge of the flattened tubular element as shown in Fig. 5, where a cut 16 is made along the top edge 17 for folding the tubular element so as to form the strip of bags, using a tool conventionally represented by the reference number 41. This step, like the following steps, can optionally be carried out in the packing machine.

Next, transverse welds are formed in the strip of bags as shown in Fig. 5. Each complete transverse weld comprises two narrow parallel strips 18 and 19 which can optionally be replaced by a single strip having the same total width. Similarly, a partly cut line 20 is formed parallel to the strips 18 and 19 or along the longitudinal axis of the single strip optionally substituted for the aforementioned two strips. The weld lines 18 and 19 do not reach the top edge 17, the result being a continuous strip of bags during the subsequent steps, by leaving upper zones 21 without a cut.

During a subsequent step in the actual machine, a transfer is made to a station for filling with fruit or the like 26, using a hopper or similar component 27. Subsequently a transverse weld 28 will be made for sealing the bags, and finally the individual bags are cut through the previously uncut zones marked 21, thus forming bags 29 which have been filled with the intended product and have been properly sealed.

The next step is to punch the holes marked 22 in Fig. 5. These holes are near the top edge 17 of the row of bags. The shape and arrangement of the punched zones 22 can be widely varied within the aims of the present invention; they can have a half-open structure as shown in the drawing or a completely open structure in which the punched laminar zone is completely separated. The aforementioned openings are normally disposed sufficiently near the edge 17, but so as to leave sufficient space for the optional upper transverse weld. However, the width of the upper bor-

der of material between the punched holes and the top edge 17 should provide sufficient strength for holding and carrying each individual bag.

Numerous variants can be made without departing from the scope of the invention. For example a second transverse weld 30 can be made between the top edge of the punched holes and the mouth of the bag, or can optionally be replaced by spot welds or limited areas e.g. in the immediate neighbourhood of the punched holes, to give greater strength to the handle zone.

The sealed bag will have the structure shown in Figs. 10 and 11 where, as can be seen, the bag assembly 31 has upper punched holes 32 serving as handles and a transverse sealing weld 33 and a wide netting zone 34 and a smooth bottom zone 35. As previously stated, the net zone 34 can be replaced by pairs of net zones parallel to one another or in any desired arrangement. The fruit 36 in the bag is enclosed at the top by the transverse sealing weld 33.

Other variants of bags are shown in Figs. 6 to 9, showing bags 23, 24, 25 and 37 with one or more net-like strips and a top edge with or without a second weld. The top edge can be punched in a curved, polygonal or other shape during the operation when the handle opening is made.

Claims

1. An extruded net bag for packing bulk products, characterised in that the bag comprises a portion of a flattened tubular element (1) provided with smooth non apertured zones (4, 5) and alternating net zones (2, 3) and having smooth zones adjacent at least that edge (17) of the tube which forms the mouth of the bag, which has one or two transverse welds (28, 30, 33) in the zone adjacent the bag mouth, so as to define a zone bearing punched zones (22, 32) in both sides of the bag and forming an opening serving as a handle.

2. An extruded net bag according to claim 1, characterised in that the sides of the bag are formed with welds (18, 19) which extend from the bottom edge to the smooth top edge without reaching the mouth.

3. An extruded net bag according to claim 2, characterised in that the lateral welds (18, 19) extend over approximately 75% of the corresponding dimension of the bag.

4. A method of manufacturing extruded net bags for packing bulk products according to claims 1 to 3, characterised in that it comprises initial extrusion of a tubular element (1) of synthetic material with smooth non apertured strips (4, 5) and net-like or combined laminette strips (2, 3), after which the tube is flattened so as to leave smooth zones adjacent at least one folded edge (17), after which the flattened tubular element is transferred to the machine for packing horticultural products and in which the following operations are performed: a cut (16) along the side edge corresponding to a smooth border, a double transverse weld (18, 19) for laterally bounding the bags, a partial intermediate cut (20) between the transverse welds, filling the bags, welding the mouth (28, 30, 33), punching in the zones adjacent the open edges to form through holes (22, 32) on both sides of the flattened element and thus form the handle, and separation of the bags via the partial cuts (20).

5. A method according to claim 4, characterised in that the transverse double weld (18, 19) does not reach the edge of the mouth of the bag but leaves a free zone for breaking at the end of the process.

6. A method according to claim 4, characterised in that at the same time as the handle opening is punched, a cut can be made by punching to obtain a specific shape of the upper edge of the bag.

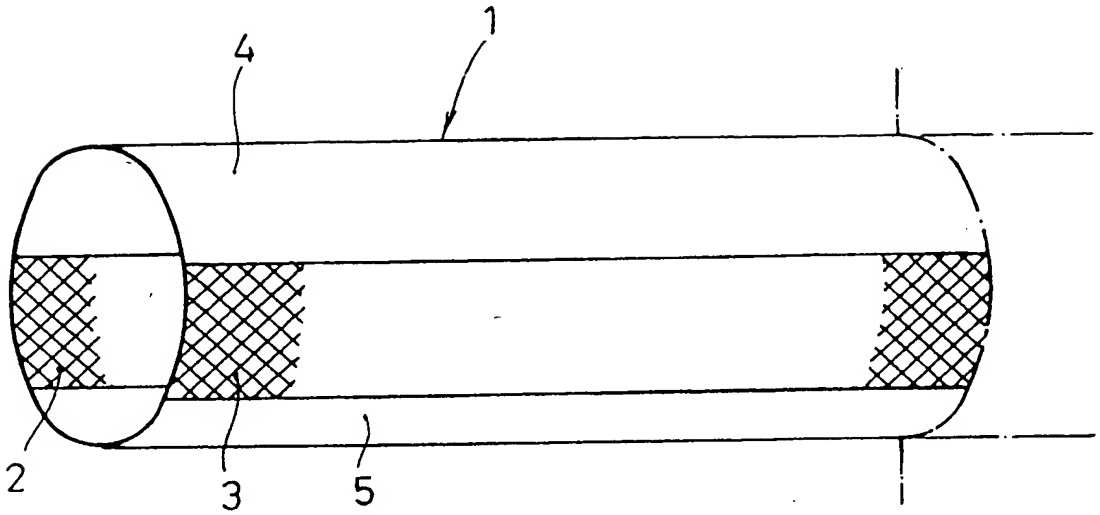

FIG. 1

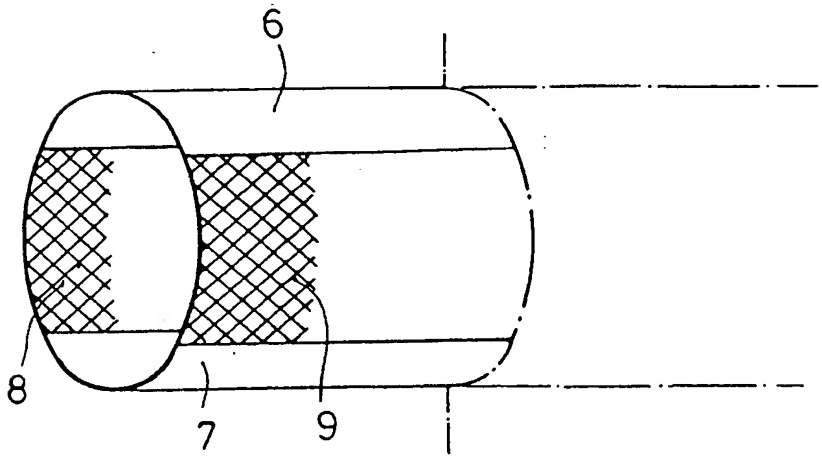

FIG. 2

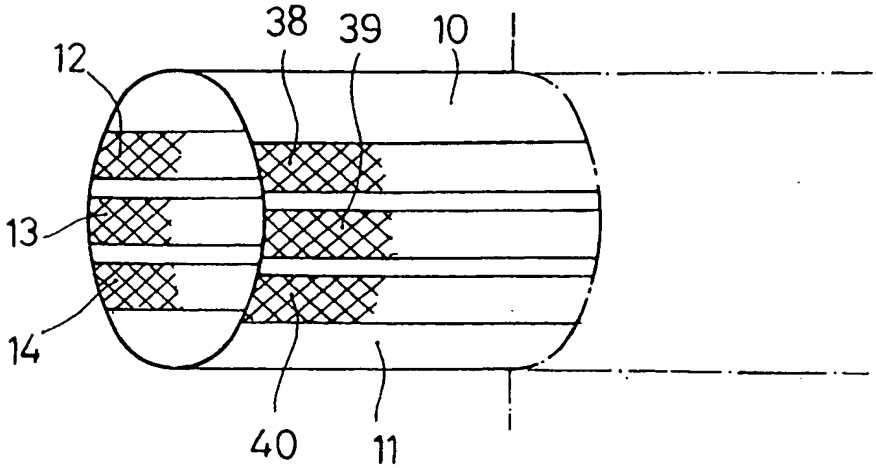

FIG. 3

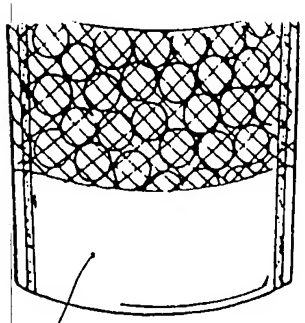

FIG. 6

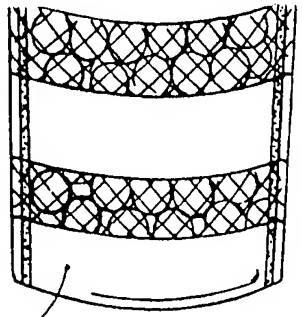

FIG. 7

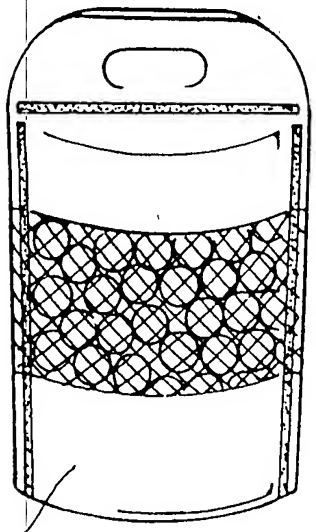

FIG. 8

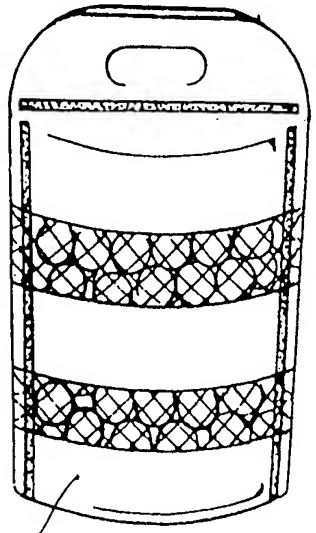

FIG. 9

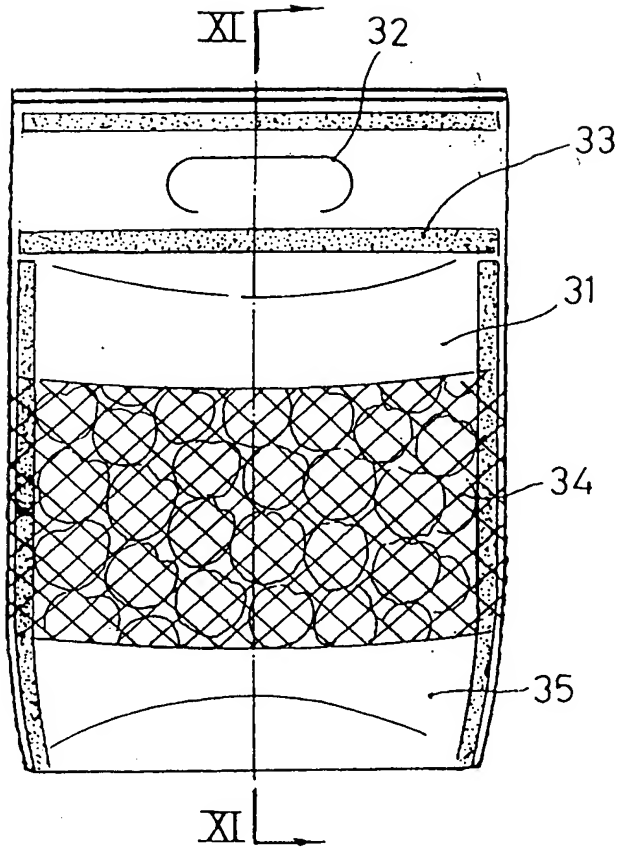

FIG. 10

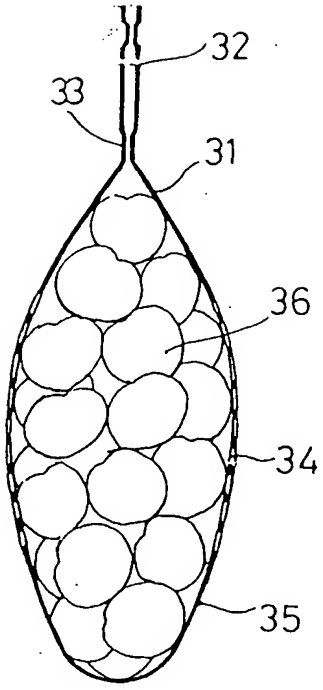

FIG. 11

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 50 0051

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP-A-0 213 986 (HUREAU) * column 2, line 53 - column 3, line 49; figures *	1,4	B65D30/06
A	EP-A-0 047 544 (SABATER) * page 2, line 14 - page 3, line 31; figures *	1,4	
A	US-A-5 007 744 (SCARBERRY) * column 4, line 26 - column 5, line 10; figure 4 *		
A	GB-A-1 295 618 (MEMBRINO) * page 3, line 109 - page 5, line 5; figures 12-16 *	1-5	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65D
B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 August 1995	SERRANO GALARRAGA, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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